Telecommunications Law Professionals PLLC

1025 Connecticut Avenue, NW
Suite 1011
Washington, DC 20036
telephone 202.789.3120
facsimile 202.789.3112
www.tlp.law

cnorthrop@tlp.law
202.789.3113

October 6, 2020

VIA ECFS

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Establishing a 5G Fund for Rural America, GN Docket No. 20-32

Dear Ms. Dortch:

On October 2, 2020, Carl Northrop, Michael Lazarus, and Kelly Laughlin of Telecommunications Law Professionals PLLC, and Laura Stefani of Mintz, all acting as counsel to AST&Science LLC ("AST"), along with Abel Avellan, (CEO of AST), Chris Ivory (CCO of AST) and Huiwen Yao, PhD (CTO of AST), met via teleconference with the following representatives of the Commission: Michael Janson (Chief of the Rural Broadband Auction Task Force); Jonathan McCormack (Deputy Director of the Rural Broadband Auction Task Force); Robert Nelson (International Bureau), Thuy Tran (Wireless Telecommunications Bureau), Ziad Sleem (Wireless Telecommunications Bureau) and Alexander Minard (Wireline Competition Bureau). The purpose of the meeting was to answer technical questions posed by the staff in connection with the AST proposal in the 5G Fund proceeding to allow mobile-satellite service providers that can provide 5G broadband service to off-the-shelf devices and handsets to participate in the 5G Fund auction; provided that they demonstrate at the short-form application stage their capability to meet the technical and performance standards for the 5G Fund.

The AST representatives explained several technical and operational aspects of the AST SpaceMobile system:

- The AST low earth orbiting ("LEO") satellites system ("SpaceMobile") is able to communicate directly with standard unmodified off-the shelf cellular devices from their 700 kilometer high orbits through the use of AST's patented architecture of large LEO satellites with specially-designed proprietary antenna arrays with very large aperture. The configuration results in enough antenna gain to enable the satellite to communicate effectively with standard mobile handsets operating on terrestrial broadband wireless frequencies.

- The AST SpaceMobile system will connect to user terminals that operate on standard 3GPP frequencies that are licensed to terrestrial carriers with which AST has agreements that grant AST consent to use the spectrum. The service will fill the terrestrial carriers' gaps in coverage to provide broadband mobile services where the terrestrial carrier spectrum is not available or in use. This mitigates and eliminates the risk of interference.

- Potential interference also will be managed by the use of other methods, including frequency selection, Inter-Cell Interference Coordination (ICIC), beams control, and power control. These techniques are discussed at length in the Technical Sharing Analysis submitted to the Commission by AST on July 6, 2020; amendment to IBFS File No. SAT-PDR-20200413-00034 (Call Sign S3065).

- Each satellite is capable of supporting approximately 2800 spot beams. The satellite can generate cellular cells ranging from 12.5 kilometers (C-band and CBRS) to 24-48 kilometers (Lowband and midband). The above-referenced Technical Sharing Analysis contains an overview of the SpaceMobile approaches for frequency sharing and interference management using parameters in this range.

- The SpaceMobile service will meet a low (sub-100 ms) latency (with latency well below 40 ms). AST holds, and/or has pending, approximately 650 patent claims, many of which pertain to advanced technology that will be implemented on the ground to address Doppler and delay.

- The SpaceMobile service will meet and exceed the download and upload speed requirements of 35 Mbps / 3 Mbps.

- AST's patented technology incorporates beam handover, which is analogous to the terrestrial user equipment (UE) handoff between neighboring base stations (eNodeB's). Based on the schedule files that list the handoff time instances, the setting satellite simultaneously turns off, and the rising satellite turns on a beam in the overlapping cell. AST's patented technologies for compensation of delay/Doppler makes the UEs in the cell being handed off see near equal delay/Doppler before and after the handoff, making them synchronize quickly to new beams from rising formation. The UE keeps track of the received signal strength (RSSI) of both the serving and adjacent beams. When the serving beam's RSSI is weaker than the adjacent beam's RSSI, it requests serving eNodeB to initiate handoff. The decision to hand off or not is made by the serving eNodeB.

AST emphasized that, at this stage of the 5G proceeding, it is asking the Commission to adopt a technology-neutral approach to the 5G Fund auction that does not pick winners and losers in advance by making providers of mobile-satellite service ineligible to participate. Under AST's proposed approach, it will have to demonstrate to the satisfaction of the Commission at the short form application stage that it can meet all of the applicable technical and performance standards applicable to recipients of 5G Funds.

Kindly refer any questions in connection with this notice to the undersigned

Sincerely,

/s/ Carl W. Northrop

Carl W. Northrop
Michael Lazarus
TELECOMMUNICATIONS LAW PROFESSIONALS PLLC
1025 Connecticut Ave, NW Suite 1011
Washington, DC 20036

Counsel for AST&Science LLC

cc (via email): Michael Janson
Jonathan McCormack
Alexander Minard
Thuy Tran
Ziad Sleem
Robert Nelson